

EG&G ROCKY FLATS

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EG&G ROCKY FLATS INC
ROCKY FLATS PLANT P O BOX 464 GOLDEN COLORADO 80402-0464 (303) 966 7000

November 25 1992

92 RF 13805

James K Hartman
Environmental Management
DOE, RFO

Attn B Thatcher

RESPONSE TO AQUATIC TOXICITY TESTING RLB 0738 92

In response to your request on November 2 1992 we are addressing issues contained in a letter (8HWM FF) from the U S Environmental Protection Agency (EPA) to Frazer Lockhart of the Department of Energy (DOE) dated April 13 1992 The letter raises four questions regarding the aquatic toxicity testing and other areas for environmental evaluations (EE) conducted at the Rocky Flats Plant In addition we will respond to the specific points brought forth in the November 2 1992 letter (12472) from J K Hartman to R L Benedetti

Although the EPA letter does not reference the specific sites where EE toxicity testing is at issue we assume that these sites are Operable Units (OU) 1 (881 Hillside) and OU2 (903 Pad) since no other OUs were being evaluated prior to April 13 1992 The National Pollution Discharge Elimination System (NPDES) Federal Facilities Compliance Agreement (FFCA) toxicity tests are part of a separate program

BACKGROUND

Aquatic toxicity testing at these OUs was initially conducted as a screening process to determine overall water quality A toxicity screen involves testing 20 organisms in a non diluted water sample as a quick test for toxicants This screen involves no dilution series Toxicity screening is designed to identify sites where more intensive sampling efforts are needed (see page 66 from Draft Final Operable Unit 1 881 Hillside Environmental Evaluation Field Sampling Plan) The screening process was never intended to be a complete monitoring effort but rather served as a cost effective first step in an overall focused characterization effort We understand that the screening process undertaken was discussed and approved by Bonnie Lavelle of the EPA

EPA COMMENTS ADDRESSED

Our responses to the specific EPA comments for OU1 and OU2 are provided below They are based on the intended scope of the screening effort

Comment 1. When samples are collected for toxicity testing simultaneous collection of water chemistry samples is not always accomplished We agree that water chemistry data are needed to interpret results of dilution series toxicity tests The

ADMIN RECORD

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James K Hartman
November 25 1992
92 RF 13805
Page 2

OU1 and OU2 screening results have revealed a need to sample OU5 (Woman Creek) and OU6 (Walnut Creek) and analyze for dilution series toxicity and chemical components. The water collection will be synoptic for both tests. These samples will allow us to revisit the OU1 and OU2 screening tests.

Comment 2. Flow measurements are not taken when the samples for toxicity testing are collected. Flow data are used to calculate a contaminant load to a site but this parameter is not called for in toxicity testing protocols. When there is flow OU5 OU6 and OU7 will include flow measurements concurrent with chemical sampling.

Comment 3. Lower detection limits for metal analyses of water samples may be necessary to evaluate potential toxicity indications. The detection limit range that the Rocky Flats General Radiochemistry and Routine Analytical Services Protocol (1991) (GRRASP) achieves for the metals of interest (copper cadmium and silver) is 5-20 µg/L. It may be that under certain conditions of hardness and pH particular metals could cause toxicity at levels below these detection limits but this appears unlikely based upon historic information on RFP surface water metal concentrations. The OU work plans use methods and detection limits approved by EPA and Colorado Department of Health (CDH) for all OU surface waters. These methods have been used for OU1 OU2 OU3 and OU5 metal detection. The guidelines for Data Quality Objectives (EPA/540/G-87/003) require consideration of precision accuracy representativeness completeness and comparability (PARCC) parameters. Comparability will be enhanced if the metal detection methods remain the same.

Comment 4. Total organic carbon (TOC) is not always included in the list of chemical analysis parameters. We agree that a known TOC can better quantify the metal availability for aquatic organisms. TOC will be analyzed in samples from the Woman Creek Walnut Creek and Landfill drainage during the OU characterization. The toxicity testing data for OU1 are contained in the Draft Final Phase 3 RFI/RI Report 881 Hillside Area (OU1) Volume 13 Appendix E Environmental Evaluation. Fathead minnow mortality was significant at only one of eleven sites. However this location Antelope Springs (SW104) is fed by subsurface flow not influenced by RFP. In general the headwaters of seeps do not provide a favorable environment for aquatic life. Further details on the water chemistry of location SW104 will be forthcoming with subsequent OU5 sampling and analysis.

Furthermore the *Ceriodaphnia* sp. data from OU1 showed 25% or greater mortality from seven out of the eleven sites sampled. The Surface Water Division (SWD) reviewed the toxicity data and surface water chemical data for OU1 and discussed potential causes of the mortality with experts. Current thinking is that the problem may be the fluctuating water balance in combination with low hardness values. Low hardness may result in increased bioavailability of metals. A complete suite of water

James K Hartman
November 25 1992
92 RF 13805
Page 3

quality data is planned for OU5 to elucidate relationships of (*in situ*) water quality and toxicity test results

The OU1 EE mentions the significant toxicity encountered by *Ceriodaphnia sp* (page E 60) but detailed explanations of the usefulness of these data relationships to other aquatic data and suggested actions were not adequately discussed To allow for efficient use of funds toxicity testing will be conducted under OU5 and OU7 investigations in accordance with the EPA concerns discussed in points 1-4 above

Preliminary toxicity data for OU2 are available These data show a minimum survival for *Ceriodaphnia sp* of 13/20 occurring in Pond B 5 The fathead minnow results in Pond B 3 Pond B 4 and Pond B 5 had survival of 10/20 6/20 and 10/20 respectively These ponds are downstream from the Sewage Treatment Plant and historical tests have shown that the ammonia levels are associated with high mortality in fathead minnows The ammonia concentrations for this test ranged from 11 to 30 mg/L Ammonia toxicity has been demonstrated in fathead minnows in concentrations as low as 7 mg/L.

STANDARD OPERATING PROCEDURE (SOP) REQUEST

The DOE letter of November 11 1992 suggested a SOP be prepared for aquatic and sediment toxicity sample collection and testing including the collection of data necessary to support the interpretation [of aquatic toxicity] Procedures and methods are already in place and govern the sample collection (EMD Operating Procedures #5 21000 POPS SW) water toxicity testing (*Methods for Measuring the Acute Toxicity of Effluent to Freshwater and Marine Organisms* USEPA 600/4 85/013 March 1985 and *Requirements for Whole Effluent Toxicity Testing* EG&G Rocky Flats EMD September 1992) and sediment toxicity testing (*Standard Guide for Conducting Sediment Toxicity Tests with Freshwater Invertebrates* ASTM Committee E 47 on Biological Effects and Environmental Fate Method E 1383 90 Annual Book of ASTM Standards Vol 14 02) activities If there are any deficiencies or issues with these established SOPs please notify us and appropriate action will be initiated

CONTRACT LABORATORY PROGRAM (CLP) vs. CLEAN WATER ACT STANDARDS

Regarding the requested evaluation of CLP protocols against the Clean Water Act (CWA) criteria and standards such an evaluation has already been incorporated into the comprehensive benchmarks table These benchmarks comprise all standards which are likely to be used to determine ARARs for clean up activities and include numerous water quality standards adopted in Colorado under the authority of the CWA Because no ARARs have been selected from the comprehensive benchmarks table no final determination can be made as to the adequacy of proposed analytical methods

Surface water samples are currently analyzed in accordance with an agreement between DOE and EPA under the NPDES FFCA Under this agreement EPA has approved

James K Hartman
November 25 1992
92 RF 13805
Page 4

analytical methods and detection limits for metals analysis in all required surface water monitoring activities (91 RF 4614) any changes to surface water analytical methodology would require EPA approval

Please contact Mark Buddy at extension 8519 or Holly Wolaver at extension 8652 with any questions on this letter or any clarifications that you may require regarding current or future EE aquatic toxicity testing programs



R L Benedetti Associate General Manager
Environmental Restoration Management
EG&G Rocky Flats Inc

HAW fm

Orig and 1 cc J K Hartman